

Patent Claims

1. A propulsion power transmission device
 - 1.1 having a first interface (1) for transmitting driving power from the propulsion power transmission device and to the propulsion power transmission device;
 - 1.2 having a second interface (2) for transmitting driving power from the propulsion power transmission device and to the propulsion power transmission device;
 - 1.3 the first and the second interfaces (1, 2) are connected to each other in a driving manner, with driving power being transmitted from the first to the second interface in a first operating mode and being transmitted from the second to the first interface in a second operating mode;
 - 1.4 a hydrodynamic clutch (3) is switched in the driving connection between the first and the second interfaces (1, 2);
 - 1.5 a first gear train (4) and a second gear train (5) are switched parallel to each other in the driving connection, in series with the hydrodynamic clutch (3), the second gear train (5) causing a reversal in the direction of rotation in relation to the first gear train (4) at one of the two interfaces (1, 2);
characterized by the following features:
 - 1.6 the hydrodynamic clutch (3) has two separate working chambers (3.1, 3.2), which can be independently filled with and drained of a working medium in order to transfer torque from one bladed primary wheel (3.3, 3.4) to at least one bladed secondary wheel (3.5) of the hydrodynamic clutch (3), with the blades (3.3.1, 3.5.1, 3.5.2, 3.4.1) of the primary wheels (3.3, 3.4) and of the at least one secondary wheel (3.5) being arranged opposite each other;

- 1.7 the first gear train (4) and the second gear train (5) are respectively continuously connected to the first primary wheel (3.1)³ and the second primary wheel (3.2)⁴ in a driving manner;
- 1.8 both gear trains (4, 5) are continuously connected to one of the two interfaces (1, 2) in a driving manner.
2. The propulsion power transmission device according to claim 1, further characterized in that the two working chambers (3.1, 3.2) are bounded by a common secondary wheel (3.5), the secondary wheel (3.5) bearing the secondary wheel blading (3.5.1, 3.5.2) of the two working chambers (3.1, 3.2) in a back-to-back arrangement.
3. The propulsion power transmission device according to one of claims 1 or 2, further characterized in that the at least one secondary wheel (3.5), in particular the common secondary wheel, is continuously connected to the first interface (1) in a driving manner and the two gear trains (4, 5) are continuously connected directly to the second interface (2) in a driving manner.
4. The propulsion power transmission device according to one of claims 1 to 3, further characterized in that opposite-lying blades (3.3.1, 3.5.1, 3.5.2, 3.4.1) of each of the primary wheels (3.3, 3.4) and of the at least one secondary wheel (3.5) are arranged at an inclination with respect to the central axis (6) of the hydrodynamic clutch (3).
5. The propulsion power transmission device according to claim 4, further characterized in that, in the first operating mode, exclusively the first working chamber (3.1) is filled with working medium and, in the second operating mode, exclusively the second working chamber (3.2) is filled with working medium and the inclined arrangement of the opposite-lying blades (3.3.1, 3.5.1, 3.5.2, 3.4.1)
-

is constructed in such a way that, during the torque transmission in the hydrodynamic clutch (3) in the respectively drained working chambers, the opposite-lying blades move in a forward-swept manner with respect to each other.

6. The propulsion power transmission device according to one of claims 2 to 5, further characterized in that the common secondary wheel (3.5) is constructed with a housing (3.6) of the hydrodynamic clutch (3) in a torsionally rigid manner and, together with the housing, encloses the two primary wheels (3.3, 3.4), at least partially.
7. The propulsion power transmission device according to one of claims 1 to 6, further characterized in that the two primary wheels (3.3, 3.4) are arranged on a common shaft (7), with one primary wheel (3.3) being mounted in a torsionally fixed manner and the other primary wheel (3.4) being mounted in a rotatable manner on the common shaft (7) and with the at least one secondary wheel (3.5) being mounted between the two primary wheels (3.3, 3.4) in a rotary manner on the common shaft (7).
8. A turbocompound system, comprising
 - 8.1 an internal combustion engine (11) having a crankshaft (12);
 - 8.2 an exhaust gas turbine (13), which is arranged in an exhaust gas flow (14) of the internal combustion engine (11) and which can be switched into a driving connection with the crankshaft (12);
characterized in that
 - 8.3 a propulsion power transmission device (10) according to one of claims 1 to 7 is switched in the driving connection between the exhaust gas turbine (13) and the crankshaft (12), with one interface (1,2), in particular the first interface (1), being connected continuously to the crankshaft (12) in a driving manner and the other interface (1, 2), in particular the second interface (2), being connected continuously to the exhaust gas turbine (13) in a driving manner.